SUGGESTED REMARKS:

SPACE STATION TECHNOLOGY WORKSHOP
WILLIAMSBURG, VIRGINIA
MARCH 31, 1983

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THANK YOU. I AM DELIGHTED TO BE HERE TONIGHT.

I WANT TO THANK YOU ALL FOR COMING AND WORKING SO HARD THESE PAST FOUR DAYS AND FOR GIVING US THE BENEFIT OF ALL YOUR WISDOM. AND I WANT TO CONGRATULATE WALT OLSTAD, CHAIRMAN OF OUR SPACE STATION TECHNOLOGY STEERING COMMITTEE, AND JACK KERREBROCK, OUR ASSOCIATE ADMINISTRATOR FOR AERONAUTICS AND SPACE TERCHNOLOGY.THEY CO-CHAIRED THIS WORKSHOP AND WORKED WITH DICK CARLISLE AND PAUL HOLLOWAY AND THE COMMITTEE MEMBERS TO MAKE IT A SUCCESS.

C.G. JUNG, WHO SPENT A LIFETIME PROBING THE FRONTIERS OF THE MIND, ONCE SAID, "YOU CAN EXERT NO INFLUENCE IF YOU ARE NOT SUSCEPTIBLE TO INFLUENCE."

I COULDN'T AGREE MORE. AND THAT'S WHY WE HOPE THAT THIS WILL BE THE FIRST OF MANY INTERACTIONS WE WILL HAVE. I CAN PROMISE YOU THAT WE WILL TAKE A LONG AND HARD LOOK AT YOUR EXAMINATION AND ASSESSMENT OF TECHNOLOGY FOR A FUTURE SPACE STATION. AND NOW THAT THOSE OF YOU IN INDUSTRY KNOW MORE ABOUT WHAT WE ARE DOING, WE HOPE THAT YOU WILL REEXAMINE YOUR OWN IR&D ACTIVITIES TO SEE WHERE THEY COULD COMPLEMENT OUR PROGRAM. OUR COMBINED RESOURCES COULD HAVE A SIGNIFICANT IMPACT ON THIS VERY IMPORTANT PROSPECTIVE NATIONAL INITIATIVE.

THE END RESULT COULD BE THAT THE SPACE STATION PLANNING PROCESS WOULD SERVE AS THE FOCAL POINT FOR THE DEVELOPMENT OF NEW ADVANCED TECHNOLOGY. AS WAS THE CASE WITH APOLLO AND WITH THE SPACE SHUTTLE, DEVELOPMENTS OF THIS KIND NOT ONLY STRENGTHEN THE GOVERNMENT-INDUSTRY-UNIVERSITY PARTNERSHIP THAT NASA PIONEERED, BUT BENEFIT THE NATION AS A WHOLE.

THAT LEADS ME TO A POINT THAT YOU FULLY UNDERSTAND, BUT WHICH IS NOT SO WELL UNDERSTOOD BY MANY, INCLUDING THE POPULAR PRESS. IT IS THAT WHEN NASA UNDERTAKES NEW MISSIONS AND NEW PROGRAMS, WE DO SO NOT ONLY TO ADVANCE THE FRONTIERS OF KNOWLEDGE, BUT ALSO TO ADVANCE THE STATE OF THE ART IN TECHNOLOGY. AND THIS IS WHAT BENEFITS THE NATION IMMEASURABLY.

THE CONNECTION BETWEEN A STRONG SCIENTIFIC RESEARCH AND TECHNOLOGY PROGRAM AND A VIGOROUS ECONOMY MAY BE HARD TO MEASURE; BUT IT IS IMPOSSIBLE TO QUESTION. BY VIRTUE OF NASA'S SUCCESS, FOR EXAMPLE, GREAT COMMERCIAL OPPORTUNITIES HAVE OPENED UP - IN SATELLITE COMMUNICATIONS AND BROADCASTING, IN REMOTE SENSING OF EARTH RESOURCES, IN MANUFACTURE OF MATERIALS THAT CANNOT BE MADE ON EARTH. AND THESE OPPORTUNITIES HAVE CREATED AND CONTINUE TO CREATE NEW INDUSTRIES, NEW JOBS AND NEW PRODUCTS.

OUR MISSIONS, DIFFICULT AND CHALLENGING AS THEY ARE, SERVE AS A STIMULUS, NOT ONLY TO THOSE WHO WORK ON THEM, BUT TO THE GOAL OF ADVANCING THE FRONTIERS OF AMERICAN SCIENCE AND ENGINEERING. THEY ALSO SERVE TO STIMULATE THE MINDS OF OUR YOUNG PEOPLE AND TO PERSUADE MANY TO PURSUE CAREERS IN SCIENCE OR ENGINEERING.

I NEED NOT REMIND THIS AUDIENCE THAT THE INDUSTRIAL NATIONS OF THE WORLD ARE MOVING AHEAD OF US IN THIS RESPECT. FOR EXAMPLE, IN 1980, WE GRADUATED 69,000 ENGINEERS. THE JAPANESE, WITH HALF OUR POPULATION, GRADUATED 80,000, MORE THAN DOUBLE THE NUMBER PER CAPITA FOR EVERY ONE OF OURS. AND THE SOVIET UNION GRADUATED 320,000, ALMOST FIVE TIMES THE NUMBER WE DID.

AND IF YOU WORRY ABOUT THE JAPANESE, AND WHO DOESN'T THESE DAYS, CONSIDER THIS: WE GRADUATE SEVEN TIMES MORE ACCOUNTANTS THAN THEY DO, AND 21 TIMES MORE LAWYERS!

THE COMPETITION IS HITTING AND HITTING HARD JUST WHERE IT HURTS: IN INDUSTRIES AND HIGH TECHNOLOGY AND SCIENCE AREAS WHERE ONCE WE WERE PREEMINENT, AND, INDEED, WHICH WE ONCE CONSIDERED OUR SPECIAL DOMAIN. IN COMPUTERS, IN METALLURGY, IN STEEL, IN AUTOMOBILES, IN ELECTRONICS - IN ALL THESE FIELDS AND MORE - AMERICA, ONCE THE LEADING INDUSTRIAL GIANT OF THE WORLD, IS FEELING THE PINCH.

BOTH THE JAPANESE AND THE EUROPEANS ARE COMING ON FAST IN AERONAUTICS AND SPACE, A TREND THAT SHOULD WORRY US ALL. WE WILL SOON HAVE NOT ONLY THE AIRBUS AND ARIANE TO COMPETE WITH, BUT ALSO JAPANESE COMMERCIAL AIRCRAFT AND LAUNCH VEHICLES.

ALSO OF MAJOR CONCERN IS THE FACT THAT BOTH THE JAPANESE AND THE FRENCH HAVE MADE NATIONAL COMMITMENTS TO ACHIEVE WORLD LEADERSHIP IN CERTAIN HIGH TECHNOLOGY AREAS. BOTH NATIONS ARE CONVINCED THAT SUCH COMMITMENTS WILL BE VITAL IN SOLVING LONG-TERM ECONOMIC AND NATIONAL SECURITY PROBLEMS.

A DECADE AGO WE WERE PREEMINENT IN PHYSICS. BUT TODAY, ACCORDING TO SOME OF OUR MOST PROMINANT PHYSICISTS, WE HAVE SLIPPED BEHIND THE EUROPEANS FOR THE FIRST TIME SINCE WORLD WAR 11. WITH THE DISCOVEY IN SWITZERLAND LAST FALL OF THE "W" PARTICLE, THE CARRIER OF ONE OF THE FOUR FUNDAMENTAL FORCES IN THE UNIVERSE, WE HAVE TO ASK OURSELVES IF, IN THE LONG RUN, OUR NATION CAN LIVE OFF DERIVATIVE SCIENCE. AS WOLFGANG PANOWSKY, DIRECTOR OF THE STANFORD LINEAR ACCELERATOR, HAS POINTED OUT, WE PROBABLY CANNOT.

TECHNOLOGY ADVANCEMENT AND THE TRAINING OF A SKILLED TECHNICAL WORK FORCE FOR INDUSTRY REALLY DEPENDS UPON LEADERSHIP IN BASIC SCIENCE. AND, AS WE HAVE SEEN, THAT KIND OF LEADERSHIP IS IMPORTANT, NOT JUST FOR ITS OWN SAKE, BUT BECAUSE GOOD PEOPLE AT THE TOP OF THEIR PROFESSIONS CAN STIMULATE YOUNGER ONES, WHO, IN TURN, CARRY ON THE TRADITION.

BASIC SCIENCE HAS ALWAYS BEEN FUNDAMENTAL TO THE THINGS NASA DOES. AND IT WILL CONTINUE TO BE.

AS MANKIND MOVES INEXORABLY ACROSS THE ENDLESS FRONTIER OF SPACE, AS WE CONTINUE TO INCREASE OUR KNOWLEDGE OF THE EARTH, THE PLANETS, THE GALAXIES AND THE UNIVERSE, I HAVE EVERY CONFIDENCE THAT WE WILL REVERSE PRESENT TRENDS AND GO ON TO SURPASS EVEN OUR PAST ACHIEVEMENTS.

THE KEY LIES IN THE RESOURCEFULNESS, CREATIVITY AND ENDLESS INGENUITY OF MEN AND WOMEN, WORKING ON EARTH AND IN SPACE. SINCE THE BEGINNING OF THE SPACE AGE WE HAVE PROVED TIME AND TIME AGAIN THAT IT IS PEOPLE WHO ADD THE EXTRA DIMENSION TO WHAT WE DO.

ENGINEERS HAVE LONG KNOWN THIS, BUT SOME SCIENTISTS FIND IT HARD TO ACCEPT. SINCE THE BEGINNING OF THE SPACE AGE SOME IN THE SCIENTIFIC COMMUNITY HAVE ARGUED THAT PEOPLE ARE SECONDARY TO AUTOMATED TECHNOLOGY IN SPACE EXPLORATION. TODAY, THANKS TO MERCURY, GEMINI, APOLLO, SKYLAB AND THE SPACE SHUTTLE, WE KNOW THAT MAN CAN DO THINGS IN SPACE THAT MACHINES CANNOT.

BUT THERE ARE STILL THOSE WHO SAY THAT MAN IS NOT SUITED TO SPACE; THAT HE IS, AT BEST, EQUIPPED TO BE AN EARTHBOUND OBSERVER, AN ARMCHAIR TRAVELER, ON THE SPACE FRONTIER.

I CAN'T BUY THAT VIEW. IT IS NOT ONLY SHORT-SIGHTED, BUT IT ALSO PUTS LIMITS ON MAN'S BOUNDLESS ENERGY, CURIOSITY, IMAGINATION, YES, AND EVEN HIS ASPIRATIONS.

THERE'S AN OLD ADAGE THAT KIND OF SUMS UP MY VIEW. IT GOES:

"BITE OFF MORE THAN YOU CAN CHEW

THEN CHEW IT.

PLAN MORE THAN YOU CAN DO,

THEN DO IT."

WITH YOU HELP, AND WORKING TOGETHER, WE ARE GOING TO CONTINUE TO ADVANCE. THE GREAT FACT TO REMEMBER IS THAT THE TREND LINE OF CIVILIZATION ITSELF IS ALWAYS UPWARD. AND THIS NATION HAS FOLLOWED THAT LINE SINCE ITS BIRTH, MAINLY BECAUSE WE HAVE HAD THE COURAGE AND WILL AND DETERMINATION NOT ONLY TO PLAN OUR FUTURE, BUT TO BUILD IT WITH OUR OWN HANDS.

WE <u>WILL</u> GO ON. WE ARE GOING TO BUILD A SPACE STATION. IT IS THE RIGHT THING FOR NASA, AND IT IS THE RIGHT THING FOR THE NATION. AND THE STATION WE DO BUILD WILL REQUIRE NEW TECHNOLOGIES, TECHNOLOGIES THAT WILL COME FROM THE NASA CENTERS, FROM AMERICAN INDUSTRY AND FROM AMERICAN UNIVERSITIES.

IF THE PAST IS ANY GUIDE, LET NO ONE SUPPOSE THAT OUR PATH WILL BE STREWN WITH ROSES. IT WILL BE AN UPHILL FIGHT, BUT WE ARE USED TO UPHILL FIGHTS. WE KNOW THAT ADVANCES DO NOT COME EASILY.

AS JAMES BRYANT CONANT ONCE WROTE: "BEHOLD THE TURTLE. HE MAKES PROGRESS ONLY WHEN HE STICKS HIS NECK OUT."

I HAVE A TOUGH NECK. I'VE STUCK IT OUT A LOT RECENTLY. AND I'VE GOTTEN A FEW NICKS WHERE THEY TRIED TO CHOP IT OFF.

NEVERTHELESS, LET ME ASSURE YOU, I WON'T HESITATE TO STICK IT OUT AGAIN, IF I HAVE TO, WHEREVER AND WHENEVER NECESSARY.

THANK YOU VERY MUCH.